

WHAT IS CLAIMED IS:

1. An auto focus mechanism which mounts a target of reading on a manuscript board and moves an optical reading means elongated in a main scanning direction along a sub scanning direction to read an image of said target of reading and which is provided to an image input apparatus for inputting image data, said mechanism comprising:

an optical read portion including: an optical source for irradiating said target of reading with a reading light ray; a lens which accepts a reflected light ray from said target of reading and is long in a main scanning direction; a lens thickness change portion which is attached on both sides of said lens in a longitudinal direction thereof and mechanically operates so as to change the thickness of said lens in the longitudinal direction by an electric signal; a SELFOC lens for passing therethrough a reflected light ray passed through said lens in the form of a parallel light beam to be focalized at a central portion; and a photoelectric transfer portion which photoelectric-transfers a reflected light ray focalized by said SELFOC lens to generate image data;

a control portion for generating a control signal for controlling the drive of said lens thickness change portion based on an electric signal photoelectric-transferred by said photoelectric transfer portion; and

a drive portion which generates a drive signal for driving said lens thickness change portion based on said control signal from said control portion and which outputs said drive signal to said lens thickness change portion to partially change the thickness of said lens in said main scanning direction.

2. The auto focus mechanism according to claim 1, wherein said lens thickness change portion is constituted by a piezoelectric device for converting an electrical action by a drive signal supplied from said drive portion into a mechanical action of pushing said lens from a side surface.

3. The auto focus mechanism according to claim 2, wherein

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said control portion is constituted by an auto focus unit which detects a part of said electric signal outputted from said photoelectric transfer portion corresponding to an edge of a detected image and which outputs a focus signal as a control signal for focusing.

4. The auto focus mechanism according to claim 3, wherein said drive portion is constituted by a piezoelectric device drive circuit which accepts said focus signal as said control signal outputted from said auto focus unit as said control portion and mechanically operates said piezoelectric device as said lens thickness change portion by using said focus signal.

5. The auto focus mechanism according to claim 3, wherein said photoelectric transfer portion is constituted by a CCD sensor which has a plurality of pixels of a charge coupled device arranged and converts a light ray received by each pixel into an electric signal to be outputted.

6. The auto focus mechanism according to claim 1, wherein said long lens is constituted by a soft material capable of changing its thickness by movement of said lens thickness change portion provided on both sides of said long lens by a weak electric signal.

7. The auto focus mechanism according to claim 1, wherein said lens thickness change portion is constituted by a piezoelectric device which converts an electrical action caused due to a drive signal supplied from said drive portion into a mechanical action of pushing said lens from a side surface, and said piezoelectric device is divided into a plurality of blocks with respect to one lens in a main scanning direction thereof.

8. The auto focus mechanism according to claim 7, wherein said control portion is constituted by an auto focus unit which detects a part of said electric signal outputted from said photoelectric transfer portion corresponding to an edge of a

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detected image and which outputs a focus signal as a control signal for focusing.

9. The auto focus mechanism according to claim 8, wherein said drive portion is constituted by a piezoelectric device drive circuit which accepts said focus signal as said control signal outputted from said auto focus unit as said control portion and mechanically operates said piezoelectric device as said lens thickness change portion by said focus signal.

10. The auto focus mechanism according to claim 9, wherein said drive portion is constituted by a piezoelectric device drive circuit which accepts said focus signal as said control signal outputted from said auto focus unit as said control portion and mechanically operates said piezoelectric device as said lens thickness change portion by using said focus signal.

11. The auto focus mechanism according to claim 9, wherein said photoelectric transfer portion is constituted by a CCD sensor which has a plurality of pixels of a charge coupled device arranged and converts a light ray received by each pixel into an electric signal to be outputted.

12. The auto focus mechanism according to claim 7, wherein said long lens is constituted by a soft material capable of changing its thickness by movement of said lens thickness change portion provided on both sides of said long lens by a weak electric signal.

13. The auto focus mechanism according to claim 1, wherein said lens thickness change portion is constituted by a piezoelectric device which converts an electrical action by a drive signal supplied from said drive portion into a mechanical action of pushing said lens from a side surface, and said piezoelectric device is divided into a plurality of blocks with respect to one lens in a main scanning direction thereof, a plurality of said block being capable of individually varying

09671152-092800

focal distances in accordance with each block.

14. The auto focus mechanism according to claim 13, wherein said control portion is constituted by an auto focus unit which detects a part of said electric signal outputted from said photoelectric transfer portion corresponding to an edge of a detected image and which outputs a focus signal as a control signal for focusing.

15. The auto focus mechanism according to claim 14, wherein said drive portion is constituted by a piezoelectric device drive circuit which accepts said focus signal as said control signal outputted from said auto focus unit as said control portion and mechanically operates said piezoelectric device as said lens thickness change portion by using said focus signal.

16. The auto focus mechanism according to claim 15, wherein said drive portion is constituted by a piezoelectric device drive circuit which accepts said focus signal as said control signal outputted from said auto focus unit as said control portion and mechanically operates said piezoelectric device as said lens thickness change portion by using said focus signal.

17. The auto focus mechanism according to claim 15, wherein said photoelectric transfer portion is constituted by a CCD sensor which has a plurality of pixels of a charge coupled device arranged and converts a light ray received by each pixel into an electric signal to be outputted.

18. The auto focus mechanism according to claim 13, wherein said long lens is constituted by a soft material capable of changing its thickness by movement of said lens thickness change portion provided on both sides of said long lens by a weak electric signal.

X 19. ^μ_W auto focus mechanism which mounts a target of reading on a manuscript board and moves a optical reading means

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elongated in a main scanning direction along a sub scanning direction to read an image of said target of reading and which is provided to an image input apparatus for inputting image data, said mechanism comprising:

optical reading means including: an optical source for irradiating said target of reading with a reading light ray; a lens which accepts a reflected light ray from said target of reading and is long in a main scanning direction; lens thickness changing means which is attached on both sides of said lens in a longitudinal direction thereof and mechanically operates so as to change the thickness of said lens in the longitudinal direction by an electric signal; a SELFOC lens for passing therethrough a reflected light ray passed through said lens in the form of a parallel light beam to be focalized at a central portion; and photoelectric transferring means which photoelectric-transfers a reflected light ray focalized by said SELFOC lens to generate image data;

controlling means for generating a control signal for driving said lens thickness changing means based on an electric signal photoelectric-transferred by said photoelectric transferring means; and

driving means which generates a drive signal for driving said lens thickness changing means based on said control signal from said controlling means and outputs said drive signal to said lens thickness changing means to partially change the thickness of said lens in said image scanning direction.

20. The auto focus mechanism according to claim 19, wherein said long lens is constituted by a soft material capable of changing its thickness by movement of said lens thickness change portion provided on both sides of said long lens by a weak electric signal.

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